

WHAT IS CLAIMED IS:

- 1 **1.** A lightweight, laminated structural component made of thin
2 metal plies comprising at least one sheet metal component
3 that is uninterrupted throughout its area and at least one
4 further sheet metal component constructed as a framework
5 forming a lattice, and a first adhesive bond between said
6 at least one sheet metal component and said lattice.

- 1 **2.** The lightweight, laminated structural component of claim 1,
2 wherein said at least one sheet metal component comprises
3 a first sheet metal ply that is uninterrupted throughout
4 its area, a second sheet metal ply that is also
5 uninterrupted throughout its area, a second adhesive bond
6 between said first and second uninterrupted metal plies to
7 form a first ply structure, and wherein said further sheet
8 metal component comprises a first sheet metal lattice, a
9 second sheet metal lattice and a third adhesive bond
10 between said first and second sheet metal lattices, to form
11 a second ply structure, and wherein said second ply
12 structure is bonded to said first ply structure by said
13 first adhesive bond.

- 1 **3.** The lightweight, laminated structural component of claim 1,
2 further comprising stiffening members (18, 19) operatively
3 secured at least partly to said lattice for forming a skin
4 of an aircraft fuselage, said stiffening members extending

radially inwardly relative to a longitudinal central axis
of said aircraft fuselage.

4. The lightweight, laminated structural component of claim 3,
wherein said stiffening members comprise stringers (18)
extending in parallel to said longitudinal central axis,
and ribs (19) extending circumferentially relative to said
longitudinal central axis.

5. The lightweight, laminated structural component of claim 3,
wherein said lattice comprises struts (10, 11, 12) forming
an integral part of said lattice and positioned for
strengthening said lattice in accordance with load
dependent criteria.

6. The lightweight, laminated structural component of claim 5,
wherein said struts (11, 12) extend in parallel to said
stiffening members (18, 19) and/or at an angle relative to
said stiffening members.

7. The lightweight, laminated structural component of claim 1,
wherein said lattice comprises sheet metal strip shaped
lands positioned for facing into an aircraft fuselage, said
strip shaped lands forming at least one sheet metal ply
with open fields surrounded by said strip shaped lands.

8. The lightweight, laminated structural component of claim 1,
wherein said at least one sheet metal component and said

3 further sheet metal component forming said lattice have a
4 thickness within the range of 0.5 mm to 5.0 mm.

1 **9.** The lightweight, laminated structural component of claim 1,
2 wherein said at least one sheet metal component and said at
3 least one further sheet metal component are made of a metal
4 selected from the group of: alloys of aluminum, alloys of
5 titanium, steel alloys, alloys of copper, alloys of zinc,
6 and alloys of magnesium.

1 **10.** A method for manufacturing a lightweight, laminated
2 structural component comprising the following steps:

3 (a) preparing a sheet metal component forming at least one
4 sheet metal ply that is uninterrupted throughout its
5 area,

6 (b) preparing a sheet metal framework as a lattice having
7 strip shaped lands surrounding open fields, and

8 (c) adhesively bonding said lattice to said at least one
9 sheet metal ply.

1 **11.** The method of claim 10, wherein said adhesive bonding is
2 performed so that at least portions of said lattice are
3 adhesively bonded to said at least one sheet metal ply and
4 wherein said portions are determined by load distribution
5 patterns to which said structural component is exposed.

1 **12.** The method of claim 10, wherein said preparing steps and
2 said adhesive bonding step are performed as a continuous,
3 uninterrupted production operation.

1 **13.** The method of claim 10, comprising using an epoxy film as
2 a bonding layer between said lattice and said sheet metal
3 component.

1 **14.** The method of claim 10, further comprising preparing at
2 least two uninterrupted sheet metal plies, adhesively
3 bonding said at least two uninterrupted sheet metal plies
4 to each other, preparing at least one lattice, and
5 adhesively bonding said at least one lattice to said at
6 least two uninterrupted sheet metal plies.

1 **15.** The method of claim 10, further comprising securing
2 stiffening members (18, 19) to said strip shaped lands by
3 any one or more of the following steps: adhesive bonding,
4 riveting and welding.